

## CLAIMS

What is claimed is:

1 1. In a controllee electronic apparatus, a method of operation comprising:  
2 providing a remote control with a first collection of user interface displays for  
3 controlling the controllee electronic apparatus;  
4 receiving first control commands from said remote control, resulting from  
5 said provided first collection of user interface displays being used by a user of said  
6 remote control; and  
7 controlling operation of said controllee electronic apparatus in accordance  
8 with said received first control commands.

1 2. The method of claim 1, wherein said providing to a remote control with a  
2 first collection of user interface displays for controlling the controllee electronic  
3 apparatus comprises providing the remote control with a first collection of user  
4 interface displays having a plurality of display states and associated display state  
5 transition rules.

1 3. The method of claim 1, wherein said providing to a remote control with a  
2 first collection of user interface displays for controlling the controllee electronic  
3 apparatus comprises providing the remote control with a first collection of user  
4 interface displays having a plurality of display cells.



1      8.      The method of claim 1, wherein said receiving of first control commands  
2      from the remote control comprises receiving said first control commands from the  
3      remote control through a selected one of a wireless optical connection in  
4      accordance with a wireless optical communication protocol, a wireless eletro-  
5      magnetic connection in accordance with a wireless communication protocol and a  
6      wired electrical connection in accordance with a wired communication protocol.

1        9.        The method of claim 1, wherein said first control commands comprise  
2        control commands for controlling a plurality of operation characteristics of said  
3        controllee electronic apparatus, and said plurality of operation characteristics  
4        comprise selected ones of power on/off, channel selections, audio volume, picture  
5        brightness, and picture color.

1     10.     The method of claim 1, wherein said method further comprises providing  
2     said remote control with a second collection of user interface displays for  
3     controlling an auxiliary controllee electronic device coupled to said controllee  
4     electronic apparatus.

1 11. The method of claim 10, wherein said providing to the remote control with a  
2 second collection of user interface displays for controlling the auxiliary controllee  
3 electronic device comprises providing the remote control with a second collection  
4 of user interface displays having a plurality of display states and associated  
5 display state transition rules.



3 receiving from said auxiliary controllee electronic device an XML based  
4 specification.

1 16. The method of claim 14, wherein said receiving of specifications of the  
2 substantive contents of said second collection of user interface displays comprises  
3 receiving the specifications of the substantive contents of said second collection of  
4 user interface displays from the auxiliary controllee electronic device through a  
5 selected one of a wireless optical connection in accordance with a wireless optical  
6 communication protocol, a wireless eletro-magnetic connection in accordance with  
7 a wireless communication protocol, and a wired electrical connection in  
8 accordance with a wired communication protocol.

1 17. The method of claim 16, wherein the specifications of the substantive  
2 contents of said second collection of user interface displays are received from the  
3 auxiliary controllee electronic device through a video connection, using a message  
4 based communication protocol embedded within a video protocol.

1 18. The method of claim 10, wherein said method further comprises  
2 receiving second control commands from said remote control, resulting  
3 from said provided second collection of user interface displays being used by said  
4 user of said remote control; and  
5 controlling operation of said auxiliary controllee electronic device in accordance  
6 with said received second control commands.

1 19. The method of claim 18, wherein said receiving of second control  
2 commands from the remote control comprises receiving said second control  
3 commands from the remote control through a selected one of a wireless eletro-  
4 magnetic connection in accordance with a wireless communication protocol, a  
5 wireless eletro-magnetic connection in accordance with a wireless communication  
6 protocol, and a wired electrical connection in accordance with a wired  
7 communication protocol.

1 20. The method of claim 18, wherein said controlling of the operation of the  
2 auxiliary controllee electronic device comprises relaying the received second  
3 commands to the auxiliary controllee electronic device.

1 21. The method of claim 20, wherein said relaying of the received second  
2 control commands comprises relaying the received second control commands  
3 through a selected one of a wireless optical connection in accordance with a  
4 wireless optical communication protocol, a wireless eletro-magnetic connection in  
5 accordance with a wireless communication protocol, and a wired electrical  
6 connection in accordance with a wired communication protocol.

1 22. The method of claim 10, wherein said auxiliary controllee electronic device  
2 is a selected one of a videocassette recorder (VCR), a digital versatile disk (DVD)  
3 player, a home theatre audio control unit, and a video camera.

1 23. The method of claim 22, wherein said second control commands comprise  
 2 control commands for controlling a plurality of operation characteristics of said  
 3 auxiliary controllee electronic device, and said plurality of operation characteristics  
 4 comprise selected ones of power on/off, play, fast forward, reverse, pause, stop,  
 5 audio volume, picture brightness, and picture color.

1 24. The method of claim 1, wherein said controllee electronic apparatus is a  
 2 TV.

1 25. The method of claim 1, wherein said controllee electronic apparatus is a  
 2 selected one of a set top box, a DVD player, a VCR .

1 26. In a auxiliary controllee electronic device coupled to a primary controllee  
 2 electronic device, a method of operation comprising:  
 3 providing specifications for a collection of user interface displays for  
 4 controlling the auxiliary controllee electronic device to the primary controllee  
 5 electronic device for the primary controllee electronic device to generate and  
 6 provide the collection of user interface displays to a remote control;  
 7 receiving control commands from said remote control, resulting from said  
 8 provided collection of user interface displays being used by a user of said remote  
 9 control; and

10 controlling operation of said auxiliary controllee electronic device in  
11 accordance with said received control commands.

1 27. The method of claim 26, wherein said providing of specifications for a  
2 collection of user interface displays for controlling the auxiliary controllee electronic  
3 device comprises providing specifications for a collection of user interface displays  
4 having a plurality of display states and associated display state transition rules.

1 28. The method of claim 26, wherein said providing of specifications for a  
2 collection of user interface displays for controlling the auxiliary controllee electronic  
3 device comprises providing specifications for a collection of user interface displays  
4 having a plurality of display cells.

1 29. The method of claim 26, wherein said providing of specifications for a  
2 collection of user interface displays for controlling the auxiliary controllee electronic  
3 device comprises providing an XML based specification specifying the substantive  
4 contents of the collection of user interface displays.

1 30. The method of claim 26, wherein said providing of specifications of a  
2 collection of user interface displays for controlling the auxiliary controllee electronic  
3 device comprises providing the specifications of the collection of user interface  
4 displays from the auxiliary controllee electronic device to the primary controllee  
5 electronic device through a selected one of a wireless optical connection in



6 accordance with a wireless optical communication protocol, a wireless eletro-  
7 magnetic connection in accordance with a wireless communication protocol, a  
8 wired electrical connection in accordance with a wired communication protocol.

1 31. The method of claim 26, wherein the specifications for the collection of user  
2 interface displays are provided from the auxiliary controllee electronic device to the  
3 primary controllee electronic device through a video connection, using a message  
4 based communication protocol embedded within a video protocol.

1 32. The method of claim 26, wherein said receiving of the control commands  
2 comprises receiving the control commands directly from the remote control  
3 through a selected one of a wireless optical connection in accordance with a  
4 wireless optical communication protocol, a wireless eletro-magnetic connection in  
5 accordance with a wireless communication protocol, and a wired electrical  
6 connection in accordance with a wired communication protocol.

1 33. The method of claim 26, wherein said receiving of the control commands  
2 comprises receiving the control commands indirectly via said primary controllee  
3 electronic device through a selected one of a wireless optical connection in  
4 accordance with a wireless optical communication protocol, a wireless eletro-  
5 magnetic connection in accordance with a wireless communication protocol, and a  
6 wired electrical connection in accordance with a wired communication protocol.



6 providing first control commands to the primary controllee electronic device  
7 to control the primary controllee electronic device in response to said usage of the  
8 first collection of user interface displays.

1 39. The method of claim 38, wherein said receiving of a first collection of user  
2 interface displays for controlling the primary controllee electronic device comprises  
3 receiving a first collection of user interface displays having a plurality of display  
4 states and associated display state transition rules.

1 40. The method of claim 38, wherein said receiving of a first collection of user  
2 interface displays for controlling the primary controllee electronic device comprises  
3 receiving a first collection of user interface displays having a plurality of display  
4 cells.

1 41. The method of claim 38, wherein said receiving of the first collection of user  
2 interface displays for controlling the primary controllee electronic device comprises  
3 receiving the first collection of user interface displays to control the primary  
4 controllee electronic device through a selected one of a wireless optical  
5 connection in accordance with a wireless optical communication protocol, a  
6 wireless eletro-magnetic connection in accordance with a wireless communication  
7 protocol, a wired electrical connection in accordance with a wired communication  
8 protocol.

1 42. The method of claim 38, wherein said providing of the first control  
2 commands comprises providing the first control commands to the primary  
3 controllee electronic device through a selected one of a wireless optical  
4 connection in accordance with a wireless optical communication protocol, a  
5 wireless eletro-magnetic connection in accordance with a wireless communication  
6 protocol, a wired electrical connection in accordance with a wired communication  
7 protocol.

1 43. The method of claim 38, wherein said first control commands comprise  
2 control commands for controlling a plurality of operation characteristics of said  
3 primary controllee electronic device, and said plurality of operation characteristics  
4 comprise selected ones of power on/off, channel selections, audio volume, picture  
5 brightness, and picture color.

1 44. The method of claim 38, wherein the method further comprises  
2 receiving a second collection of user interface displays from the primary  
3 controllee electronic device for controlling an auxiliary controllee electronic device  
4 coupled to the primary controllee electronic device;  
5 facilitating usage of the second collection of user interface displays by a  
6 user to remotely control the auxiliary controllee electronic device; and  
7 providing second control commands either directly or indirectly to the  
8 auxiliary controllee electronic device to control the auxiliary controllee electronic

9 device in response to said usage of the second collection of user interface  
10 displays.

1 45. The method of claim 44, wherein said providing of a second collection of  
2 user interface displays for controlling the auxiliary controllee electronic device  
3 comprises providing a second collection of user interface displays having a  
4 plurality of display states and associated display state transition rules.

1 46. The method of claim 44, wherein said providing of a second collection of  
2 user interface displays for controlling the auxiliary controllee electronic device  
3 comprises providing a second collection of user interface displays having a  
4 plurality of display cells.

1 47. The method of claim 44, wherein said providing of the second collection of  
2 user interface displays for controlling the auxiliary controllee electronic device  
3 comprises providing the second collection of user interface displays from the  
4 primary controllee electronic device to the remote control through a selected one  
5 of a wireless optical connection in accordance with a wireless optical  
6 communication protocol, a wireless eletro-magnetic connection in accordance with  
7 a wireless communication protocol, a wired electrical connection in accordance  
8 with a wired communication protocol.

1 48. The method of claim 44, wherein said providing of the second control  
2 commands comprises providing the second control commands through a selected  
3 one of a wireless optical connection in accordance with a wireless optical  
4 communication protocol, a wireless eletro-magnetic connection in accordance with  
5 a wireless communication protocol, and a wired electrical connection in  
6 accordance with a wired communication protocol.

1 49. The method of claim 44, wherein said auxiliary controllee electronic device  
2 is a selected one of a videocassette recorder (VCR), a digital versatile disk (DVD)  
3 player, a home theatre audio control unit, and a video camera.

1 50. The method of claim 49, wherein said second control commands comprise  
2 control commands for controlling a plurality of operation characteristics of said  
3 auxiliary controllee electronic device, and said plurality of operation characteristics  
4 comprise selected ones of power on/off, play, fast forward, reverse, pause, stop,  
5 audio volume, picture brightness, and picture color.

1 51. The method of claim 38, wherein said primary controllee electronic device is  
2 a TV.

1 52. The method of claim 38, wherein said primary controllee electronic device is  
2 a selected one of a set top box, a DVD player and a VCR player.

53. A controlle electronic apparatus comprising:

first means to provide a remote control with a first collection of user interface displays for controlling the controllee electronic apparatus, and to receive first control commands from said remote control, resulting from said provided first collection of user interface displays being used by a user of said remote control;

and

second means to control operation of said controllee electronic apparatus in accordance with said received first control commands.

1 54. The apparatus of claim 53, wherein said first means provides the remote  
2 control with a first collection of user interface displays having a plurality of display  
3 states and associated display state transition rules.

1 55. The apparatus of claim 53, wherein said first means provides the remote  
2 control with a first collection of user interface displays having a plurality of display  
3 cells.

1 56. The apparatus of claim 53, wherein said first means provides the remote  
2 control with the first collection of user interface displays through a selected one of  
3 a wireless optical connection in accordance with a wireless optical communication  
4 protocol, a wireless eletro-magnetic connection in accordance with a wireless  
5 communication protocol, and a wired electrical connection in accordance with a  
6 wired communication protocol.

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1 57. The apparatus of claim 56, wherein said first means provides the remote  
2 control with the first collection of user interface displays through an infrared based  
3 optical connection, using an IrDA standard based wireless optical communication  
4 protocol.

1 58. The apparatus of claim 56, wherein said first means provides the remote  
2 control with the first collection of user interface displays through a wireless eletro-  
3 magnetic communication connection, using a selected one of a Bluetooth and an  
4 IEEE 802.11 standard based wireless communication protocol.

1 59. The apparatus of claim 56, wherein said first means provides the remote  
2 control with the first collection of user interface displays through a wired electrical  
3 connection that is a selected one of a serial connection, a parallel connection, a  
4 USB connection, and a IEEE 1394 based connection, using a message based  
5 communication protocol.

1 60. The apparatus of claim 53, wherein said first means receives said first  
2 control commands from the remote control through a selected one of a wireless  
3 optical connection in accordance with a wireless optical communication protocol, a  
4 wireless eletro-magnetic connection in accordance with a wireless communication  
5 protocol and a wired electrical connection in accordance with a wired  
6 communication protocol.





4 communication protocol, a wireless eletro-magnetic connection in accordance with  
5 a wireless communication protocol, and a wired electrical connection in  
6 accordance with a wired communication protocol.

1 66. The apparatus of claim 62, further comprising  
2 third means to receive from said auxiliary controllee electronic device  
3 specifications of the substantive contents of said second collection of user  
4 interface displays; and  
5 fourth means to generate said second collection of user interface displays  
6 in accordance with said received specifications.

1 67. The apparatus of claim 66, wherein said third means receives from said  
2 auxiliary controllee electronic device an XML based specification.

1 68. The apparatus of claim 66, wherein said third means receives the  
2 specifications from the auxiliary controllee electronic device through a selected  
3 one of a wireless optical connection in accordance with a wireless optical  
4 communication protocol, a wireless eletro-magnetic connection in accordance with  
5 a wireless communication protocol, and a wired electrical connection in  
6 accordance with a wired communication protocol.

1 69. The apparatus of claim 68, wherein said third means receives the  
2 specifications from the auxiliary controllee electronic device through a video

3 connection, using a message based communication protocol embedded within a  
4 video protocol.

1 70. The apparatus of claim 62, wherein  
2 said first means further receives second control commands from said  
3 remote control, resulting from said provided second collection of user interface  
4 displays being used by said user of said remote control; and  
5 said second and third means further cooperate to control operation of said  
6 auxiliary controllee electronic device in accordance with said received second  
7 control commands.

1 71. The apparatus of claim 70, wherein said third means receives said second  
2 control commands from the remote control through a selected one of a wireless  
3 eletro-magnetic connection in accordance with a wireless communication protocol,  
4 a wireless eletro-magnetic connection in accordance with a wireless  
5 communication protocol, and a wired electrical connection in accordance with a  
6 wired communication protocol.

1 72. The apparatus of claim 70, wherein said second and third means cooperate  
2 to relay the received second commands to the auxiliary controllee electronic  
3 device.

73. The apparatus of claim 72, wherein said second and third means cooperate to relay the received second control commands through a selected one of a wireless optical connection in accordance with a wireless optical communication protocol, a wireless eletro-magnetic connection in accordance with a wireless communication protocol, and a wired electrical connection in accordance with a wired communication protocol.

1     74.     The apparatus of claim 62, wherein said auxiliary controllee electronic  
2     device is a selected one of a videocassette recorder (VCR), a digital versatile disk  
3     (DVD) player, a home theatre audio control unit, and a video camera.

1 75. The apparatus of claim 74, wherein said second control commands  
2 comprise control commands for controlling a plurality of operation characteristics  
3 of said auxiliary controllee electronic device, and said plurality of operation  
4 characteristics comprise selected ones of power on/off, play, fast forward, reverse,  
5 pause, stop, audio volume, picture brightness, and picture color.

1 76. The apparatus of claim 53, wherein said controllee electronic apparatus is a  
2 TV.

1 77. The apparatus of claim 53, wherein said controllee electronic apparatus is a  
2 selected one of a set top box, a DVD player, a VCR .

1 78. An auxiliary controllee apparatus comprising:  
 2 first means to provide specifications for a collection of user interface  
 3 displays for controlling the auxiliary controllee electronic device to a primary  
 4 controllee electronic device for the primary controllee electronic device to generate  
 5 and provide the collection of user interface displays to a remote control;  
 6 second means to receive control commands from said remote control,  
 7 resulting from said provided collection of user interface displays being used by a  
 8 user of said remote control; and  
 9 third means to control operation of said auxiliary controllee electronic device  
 10 in accordance with said received control commands.

1 79. The apparatus of claim 78, wherein said first means provides to said  
 2 primary controllee electronic apparatus, specifications for a collection of user  
 3 interface displays having a plurality of display states and associated display state  
 4 transition rules.

1 80. The apparatus of claim 78, wherein said first means provides to said  
 2 primary controllee apparatus, specifications for a collection of user interface  
 3 displays having a plurality of display cells.

1 81. The apparatus of claim 78, wherein said first means provides to said  
 2 primary controllee electronic apparatus, an XML based specification specifying the  
 3 substantive contents of the collection of user interface displays.



4 communication protocol, a wireless eletro-magnetic connection in accordance with  
5 a wireless communication protocol, and a wired electrical connection in  
6 accordance with a wired communication protocol.

1 86. The apparatus of claim 78, wherein said apparatus is a selected one of a  
2 videocassette recorder (VCR), a digital versatile disk (DVD) player, a home theatre  
3 audio control unit, and a video camera.

1 87. The apparatus of claim 86, wherein said control commands comprise  
2 control commands for controlling a plurality of operation characteristics of said  
3 auxiliary controllee electronic apparatus, and said plurality of operation  
4 characteristics comprise selected ones of power on/off, play, fast forward, reverse,  
5 pause, stop, audio volume, picture brightness, and picture color.

1 88. The apparatus of claim 78, wherein said primary controllee electronic  
2 device is a TV.

1 89. The apparatus of claim 78, wherein said primary controllee electronic  
2 device is a selected one of a set top box, a DVD player and VCR player.

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90. A field extendable remote control apparatus comprising:  
first means to receive from a primary controllee electronic device a first collection of user interface displays for controlling a primary controllee electronic device;  
second means to facilitate usage of the first collection of user interface displays by a user to control the primary controllee electronic device; and  
third means to provide first control commands to the primary controllee electronic device to control the primary controllee electronic device in response to said usage of the first collection of user interface displays.

91. The apparatus of claim 90, wherein said first means receives from the primary controllee electronic device a first collection of user interface displays having a plurality of display states and associated display state transition rules.

92. The apparatus of claim 90, wherein said first means receives from the primary controllee electronic device a first collection of user interface displays having a plurality of display cells.

93. The apparatus of claim 90, wherein said first means receives the first collection of user interface displays from the primary controllee electronic device through a selected one of a wireless optical connection in accordance with a wireless optical communication protocol, a wireless eletro-magnetic connection in



5 accordance with a wireless communication protocol, a wired electrical connection  
6 in accordance with a wired communication protocol.

1 94. The apparatus of claim 90, wherein said third means provides the first  
2 control commands to the primary controllee electronic device through a selected  
3 one of a wireless optical connection in accordance with a wireless optical  
4 communication protocol, a wireless eletro-magnetic connection in accordance with  
5 a wireless communication protocol, a wired electrical connection in accordance  
6 with a wired communication protocol.

1 95. The apparatus of claim 90, wherein said first control commands comprise  
2 control commands for controlling a plurality of operation characteristics of said  
3 primary controllee electronic device, and said plurality of operation characteristics  
4 comprise selected ones of power on/off, channel selections, audio volume, picture  
5 brightness, and picture color.

1 96. The apparatus of claim 90, wherein  
2 said first means further receives a second collection of user interface  
3 displays from the primary controllee electronic device for controlling an auxiliary  
4 controllee electronic device coupled to the primary controllee electronic device;  
5 said second means further facilitates usage of the second collection of user  
6 interface displays by a user to remotely control the auxiliary controllee electronic  
7 device; and

8           said third means further provides second control commands either directly  
9 or indirectly to the auxiliary controllee electronic device to control the auxiliary  
10 controllee electronic device in response to said usage of the second collection of  
11 user interface displays.

1   97.    The apparatus of claim 96, wherein said first means receives from the  
2 primary controllee electronic apparatus a second collection of user interface  
3 displays having a plurality of display states and associated display state transition  
4 rules.

1   98.    The apparatus of claim 96, wherein said first means receives from the  
2 primary controllee electronic apparatus a second collection of user interface  
3 displays having a plurality of display cells.

1   99.    The apparatus of claim 96, wherein said first means receives said second  
2 collection of user interface displays from the primary controllee electronic device  
3 through a selected one of a wireless optical connection in accordance with a  
4 wireless optical communication protocol, a wireless eletro-magnetic connection in  
5 accordance with a wireless communication protocol, a wired electrical connection  
6 in accordance with a wired communication protocol.

1   100.   The apparatus of claim 96, wherein said third means provides the second  
2 control commands through a selected one of a wireless optical connection in

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3 accordance with a wireless optical communication protocol, a wireless eletro-  
4 magnetic connection in accordance with a wireless communication protocol, and a  
5 wired electrical connection in accordance with a wired communication protocol.

1 101. The apparatus of claim 96, wherein said auxiliary controllee electronic  
2 device is a selected one of a videocassette recorder (VCR), a digital versatile disk  
3 (DVD) player, a home theatre audio control unit, and a video camera.

1 102. The method of claim 101, wherein said second control commands comprise  
2 control commands for controlling a plurality of operation characteristics of said  
3 auxiliary controllee electronic device, and said plurality of operation characteristics  
4 comprise selected ones of power on/off, play, fast forward, reverse, pause, stop,  
5 audio volume, picture brightness, and picture color.

1 103. The apparatus of claim 90, wherein said primary controllee electronic  
2 device is a TV.

1 104. The apparatus of claim 90, wherein said primary controllee electronic  
2 device is a selected one of a set top box, a DVD player and a VCR player.